



# **LocoCruiser Standard series DCC decoder**

## **User Manual**

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ANE MODEL

32454 No.9, Lane 675, Sec.2,Nanping RD.

Pinjin City,Taoyuan County, Taiwan. R.O.C.

+ 886 3 4961368 / 2658082

[www.anemodel.com](http://www.anemodel.com)

[service@anemodel.com](mailto:service@anemodel.com)



**Before you start to use the decoder, please read the following warnings first.**

- 1 、 This product is for all HO scale railroad models use only and a small number of N scale railroad models.
- 2 、 Please read this manual carefully before installing the decoder.
- 3 、 Please do not use this decoder under the non-DCC control system of model train.
- 4 、 This product is not suitable for children under 8 years old. Improper use may cause injury by sharp points of edges.
- 5 、 Do not expose the product to the rain, humidity, fire, the direct sunlight and corrosive chemical product.
- 6 、 The suitable working temperature is 0-80°C.
- 8 、 Strong electromagnetic wave may interrupt the normal working of the product.
- 9 、 To avoid over-heating do not wrap the circuit board in insulation tape.
- 10 、 Do not forcedly press or fold the product.
- 11 、 This product is not waterproof.
- 12 、 Before installing the decoder, make sure to eliminate the static electricity from the installer.
- 13 、 Before installing the decoder, remove the locomotive from the track,
- 14 、 After installing the decoder, make sure that no wires are squeezed or cut.

# Contents

|                                                               |    |
|---------------------------------------------------------------|----|
| Warning .....                                                 | 1  |
| Contents .....                                                | 2  |
| 1. Introduction.....                                          | 3  |
| 2. LocoCruiser Standard decoder Series 2.....                 | 3  |
| 3.General Properties of all Decoders.....                     | 4  |
| 3.1 Operating Modes .....                                     | 4  |
| 3.2 Motor Control .....                                       | 4  |
| 3.3 Analogue Mode .....                                       | 4  |
| 3.4 Functions .....                                           | 4  |
| 3.5 Programming .....                                         | 5  |
| 3.6 Operational reliability.....                              | 5  |
| 4. Installation .....                                         | 5  |
| 4.1 Ten Steps for successful decoder installation.....        | 5  |
| 4.1.1 Avoiding heat problems with decoder installations ..... | 5  |
| 4.1.2 Recommended tools for decoder installation.....         | 6  |
| 4.2 Requirements for installation.....                        | 6  |
| 4.3 Installation recommendations .....                        | 6  |
| 4.4 Locomotive with 8-pin DCC-standard Interface.....         | 6  |
| 4.4.1 Wiring Diagram for LocoCruiser LC201.....               | 7  |
| 4.5 Locomotive with 6-pin DCC-standard Interface.....         | 7  |
| 4.5.1 Wiring Diagram for LocoCruiser LC202.....               | 8  |
| 4.6 Locomotive with 21-pin DCC-standard Interface.....        | 8  |
| 4.6.1 Wiring Diagram for LocoCruiser LC203.....               | 8  |
| 4.7 Connecting Additional Functions .....                     | 8  |
| 4.8 Suitable Light Bulbs .....                                | 9  |
| 4.9 Suitable locomotive type .....                            | 9  |
| 5. Initial operation .....                                    | 9  |
| 5.1 DCC Mode .....                                            | 9  |
| 5.1.1 DCC Speed Steps ("flashing lights").....                | 9  |
| 5.2 Speed control .....                                       | 9  |
| 5.2.1 Speed curve setting ( Factory Default ) : .....         | 9  |
| 5.2.2 Speed table mode.....                                   | 10 |
| 5.2.3 Speed model Exchange.....                               | 11 |
| 5.2.4 Acceleration & Deceleration .....                       | 11 |
| 5.3 DC control .....                                          | 11 |
| 5.3.1 DC control method.....                                  | 11 |
| 5.4 Engine address setting.....                               | 11 |
| 5.4.1 Engine address .....                                    | 11 |
| 5.4.2 Locomotive engine address setting .....                 | 11 |
| 5.5 Light effect .....                                        | 12 |
| 5.5.1 Turn on/off light.....                                  | 12 |
| 5.5.2 light effect .....                                      | 12 |
| 5.6 CV29 setting .....                                        | 12 |
| 6. Decoder Settings (Programming) .....                       | 13 |
| 6.1 Configuration Variables (CV).....                         | 13 |
| 6.1.1 Standardisation in the NMRA .....                       | 13 |
| 6.1.2 Bits and Bytes.....                                     | 14 |

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|                                                                                                                                         |    |
|-----------------------------------------------------------------------------------------------------------------------------------------|----|
| 7. CV value table .....                                                                                                                 | 14 |
| 7.1 Light function.....                                                                                                                 | 14 |
| 7.2 Speed table .....                                                                                                                   | 15 |
| 8. Disclosure announce .....                                                                                                            | 15 |
| 9. Troubleshooting .....                                                                                                                | 16 |
| 9.1 The Decoder is installed. After electrified, the lights do not work and the locomotive does not move after changing speed. ....     | 16 |
| 9.2 During the locomotive moving, the moving is not continuous.....                                                                     | 16 |
| 9.3 The locomotive runs normally, but the lights do not work .....                                                                      | 16 |
| 9.4 Headlights work, but the locomotive does not move.....                                                                              | 16 |
| 9.5 When I use the consist address control the loco, I have changed the value of CV17 & Cv18. But I still can't control the loco? ..... | 16 |
| 9.6 I have followed the manual to do, but still have problems not included in the manual. What can I do? .....                          | 16 |
| Appendix II : Repair information .....                                                                                                  | 16 |

# 1. Introduction

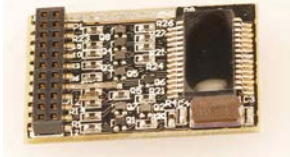
Congratulations for choosing the ANE MODEL LocoCruiser Standard series decoder. It is designed to give you exciting DCC control features at a reasonable price. ANE MODEL mobile decoder is suitable for all HO scale and some N scale locomotives with space for installation.

LocoCruiser Standard decoder compliments the excellent properties of their predecessors and expand their capabilities with extra functions. It supports the 14-step, 28-step and 128-step control of the DCC protocol and 8 lighting effects, including dimmer, warning effect, blinking by speed effect, random blinking effect, strobe light effect and 3 fixed-frequency blinking effects.

ANE MODEL Standard decoder should be your first choice as they can offer you flexibility and reliability that you have come to expect to have a state-of-the-art decoder.

**Caution:** Please feel free to contact ANE MODEL or ANE MODEL Authorized Distributor with any questions or concerns you might have about our products. We are always looking forward to hearing your voice, and make our products better. Don't hesitate to contact us!

## 2. LocoCruiser Standard decoder Series 2

|                                 | LC201<br>LocoCruiser standard<br>Back-EMF decoder with<br>NMRA 8 pin plug           | LC202<br>LocoCruiser standard<br>Back-EMF decoder<br>without NMRA 8 pin plug         | LC203<br>LocoCruiser standard<br>Back-EMF decoder<br>with NMRA 21 pin plug            |
|---------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| The picture of<br>the product   |  |  |  |
| Working voltage                 | 12V-26V                                                                             | 12V-26V                                                                              | 12V-26V                                                                               |
| Motor current                   | 1.5 Amp continuous and<br>2 Amp peak                                                | 1.5 Amp continuous and<br>2 Amp peak                                                 | 1.5 Amp continuous<br>and 2 Amp peak                                                  |
| Function output<br>voltage      | 16V                                                                                 | 16V                                                                                  | 16V                                                                                   |
| Function output<br>max. current | 300mA                                                                               | 300mA                                                                                | 300mA                                                                                 |
| Working<br>temperature          | 0—80°C                                                                              | 0—80°C                                                                               | 0—80°C                                                                                |
| Dimension(L*W<br>*T)            | 1 "(26 mm)* 0.6" (15.5<br>mm)* 0.2" (5 mm)                                          | 1 "(26 mm)* 0.6" (15.5<br>mm)* 0.2" (5 mm)                                           | 1 "(26 mm)* 0.6" (15.5<br>mm)* 0.2" (5 mm)                                            |

## 3. General Properties of all Decoders

### 3.1 Operating Modes

With the locomotive running on the layout and if you need to adjust some CV values, you don't have to move the locomotive to the programming track, you can adjust it through DCC controller's OPS mode (Operating mode), by calling up the number of the locomotive, then modify the CV value directly. **There's one thing you need to note**, OPS mode can only set the function of the decoder. It can't read the CV value of the decoder. If you need to adjust the CV value precisely, then we suggest you to move the locomotive to programming track to read and program.

### 3.2 Motor Control

In order to provide more perfectly running performance, ANE MODEL manufacture LocoCruiser Series 2, especially designed a motor control program with Back-EMF function. For a variety of locomotives, the motor will adjust output control automatically, so modellers can experience speed control and silent running with a high standard.

### 3.3 Analogue Mode

According to the setting of CV29, LocoCruiser Series 2 provides you a dual mode with the loco decoders able to run under DCC or DC control. This eliminates having to go to the trouble of temporarily removing the DCC decoder.

### 3.4 Functions

LocoCruiser Series 2 has 4~6 function outputs. Each function output can reach the maximum current of 300mA no matter whether you are controlling incandescent light bulbs or LEDs, it can achieve your needs. At the same time, each function output has a variety of lighting effects. From the simplest on/ off to a wide variety of lighting performance, LocoCruiser Series 2 is your best choice! The CV value of various lighting performance are below:

| CV value | Function                                                                    |
|----------|-----------------------------------------------------------------------------|
| 0        | Light on                                                                    |
| 2        | Strobe                                                                      |
| 4        | Mars Light                                                                  |
| 8        | Reverse direction                                                           |
| 16       | Forward direction                                                           |
| 32       | 1/4 sec flashing <b>(A)</b> <i>(this two effect design for ditch light)</i> |
| 64       | 1/4 sec flashing <b>(B)</b> <i>(this two effect design for ditch light)</i> |
| 36       | Firebox                                                                     |
| 69       | Warning light                                                               |
| 128      | 1/2 sec flashing                                                            |

### 3.5 Programming

In some part of DCC controllers, there's an individual programming track function. To connect the programming track output with single track, put the locomotive on this track, then you can read and program. LocoCruiser Series 2 decoders fully support the programming track function. You can read and adjust the CV value of LocoCruiser Series 2 decoders through the programming track, and let the Series 2 fully control the features of your locomotive as well

as running smoothly on your layout.

### 3.6 Operational reliability

LocoCruiser Series 2 running decoders have passed extensive testing and functional adaptation. It can meet the running performance of most DCC ready locomotives. You don't need to make any adjustments. In some particular locomotives, you may just need to make small adjustments of CV value to reach the perfect running performance and lighting control. We'll publish the related information on our website, please follow the description for adjusting. If you find that your locomotive doesn't run smoothly after installing the ANE MODEL decoder, please feel free to contact us at once. We will process your question promptly to make sure that your locos run smooth and trouble free.

## 4. Installation

To install the decoder is not that difficult as you think. Just follow the following simple steps carefully, you can enjoy the procedure on the instant. Each ANE MODEL decoder comes with an instruction sheet that shows you the specifics of the decoder.

### 4.1 Ten Steps for successful decoder installation

1. Read the instructions FIRST and PLAN your installation
2. Have the proper tools on hand.
3. Choose a locomotive that runs well on regular DCC or DC system.
4. Choose the appropriate decoder for the installation.
5. Test the decoder before installation.
6. Carefully remove the body of the loco.
7. Plug the pins into the socket in accordance with the marks of the decoder and the circuit board of the locomotive
8. If there's no socket or only 6-pin socket on your loco, please choose LC202 version decoder and follow the wiring diagram below.
9. Test the installation DCC.
10. Customize your decoder by programming selected CVs.

#### 4.1.1 Avoiding heat problems with decoder installations

Most HO & N scale model locomotive motors and lamps are designed by the locomotive manufacturers to operate at full speed at 12 volts DC on the track. LocoCruiser recommends running your DCC command station and boosters at the lowest track voltage possible that provides acceptable operation. The "N Scale (12 V)" setting on LocoCruiser equipment works for most HO & N scale layouts. Some DCC systems made by other companies supply more voltage to the track and are not adjustable. If the track voltage applied exceeds the operating parameters of the locomotive and its lamps, it is possible for overheating to damage your locomotive whether you use DC or DCC. For example, running an N Scale locomotive that was designed to run on 12-14 volts on a system that supplies 12 or more volts to the track may cause overheating and damage to the locomotive, its shell and your decoder.

#### 4.1.2 Recommended tools for decoder installation

You'll need a few simple tools when you begin installing decoders:

1. A soldering iron, preferably temperature controlled. Though many installations do not require soldering, you may still need to use a soldering iron to install extras like lamps for special lighting effects.
2. Solder.
3. A small screwdriver for disassembling your loco
4. Small diagonal cutters for cutting & stripping small wire.
5. Tweezers to pick up small loco parts.
6. Heat shrink tubing for protecting wire connections, this is better than electrical tape.
7. Tape for securing wires and the decoder inside the locomotive.
8. Decoder installation should be done in a reasonably static free environment. We recommend that you do all installations on a nonmetallic surface. LocoCruiser decoders are not overly sensitive to static electricity & with a little common sense, you won't have problems.

## 4.2 Requirements for installation

ANE MODEL Series 2 decoders are mainly designed for OO/HO scale(1/76~1/87) locomotives and railcars.

The different connections are listed below.

| The type of decoder | Statements                                                                                                                                                                      |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LC201               | With NMRA Medium 8 pin plug, apply to the locomotive with NMRA 8 pin socket                                                                                                     |
| LC202               | With 9 NMRA standard wiring, so modellers can solder directly to the locomotive wiring                                                                                          |
| LC203               | With NMRA 21pin socket, apply to the locomotive with 21pin plug                                                                                                                 |
| LC204               | Board replacement type decoder, suitable for most locomotives which has lack of internal space, such as: ATLAS, Athearn, KATO USA and KATO Japan locomotives.                   |
| LC205               | These are exclusive for UK with 21pin socket / If you are interested, please contact our UK distributor, LocoLine                                                               |
| LC206               | The exclusive sale for UK with 8 pin socket decoder / If you are interested, please contact with our UK distributor, LocoLine                                                   |
| LC201,LC202&LC206   | These three types of decoder have a standard NMRA JST 9 pin connector. You can buy the wiring harness from us, and replace the connector with 8 pin plug or without 8 pin plug. |

## 4.3 Installation recommendations

We strongly recommend modellers confirm that the locomotive will operate normally before installing the decoder. Also, the decoder can be tested for operation by using a Decoder Testing Board. This, can avoid problems before installation of the decoder.

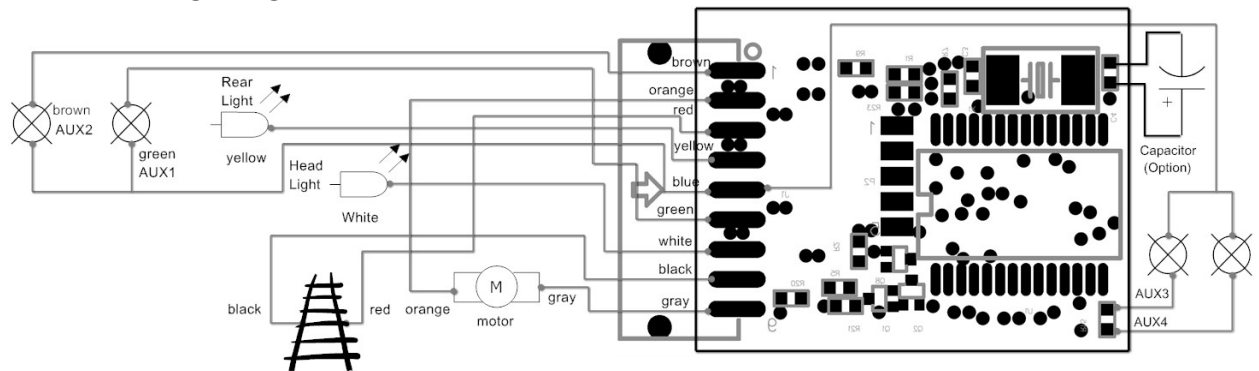
## 4.4 Locomotive with 8-pin DCC-standard Interface

According to the instructions in the locomotive manual, remove the body shell, and find the 8 pin socket. First, remove the dummy plug from the socket, and find the correct direction to insert the decoder plug( Usually there's a number or arrow marked "pin 1" on the 8 pin socket. And then fit with 8 pin head, you'll finish the installation.

The wire color comparison table of 8-pin DCC-standard interface

| No. | Color  | Connect       |
|-----|--------|---------------|
| 1   | Orange | Motor +       |
| 2   | Yellow | Rear light -  |
| 3   | Empty  | Empty         |
| 4   | Black  | Left track    |
| 5   | Gray   | Motor -       |
| 6   | White  | Front light - |
| 7   | blue   | Common + pole |
| 8   | Red    | Right track   |

#### 4.4.1 Wiring Diagram for LocoCruiser LC201



#### 4.5 Locomotive with 6-pin DCC-standard Interface

Please check the wire colors are connected to the correct parts of the locomotive.

| Pin No. | Colour | Details           |
|---------|--------|-------------------|
| 1       | Orange | Motor +           |
| 2       | Yellow | Rear Light -      |
| 3       | Empty  | Empty             |
| 4       | Black  | Left Rail         |
| 5       | Gray   | Motor -           |
| 6       | White  | Front light -     |
| 7       | Blue   | Function Common + |
| 8       | Red    | Right Rail        |

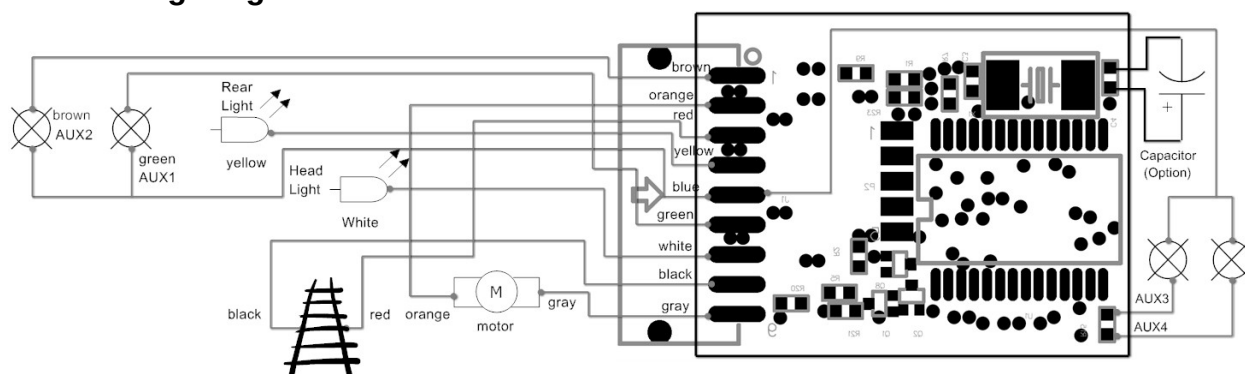
After finishing the installation, please check the motor and function wiring is completely insulated. If not, the decoder could short out and burn out. If this happens then the decoder will not be covered by warranty. **Please be careful!**

The wire color comparison table of 6-pin DCC-standard interface

| No. | Color  | Connect       |
|-----|--------|---------------|
| 1   | Orange | Motor +       |
| 2   | Gray   | Motor -       |
| 3   | Red    | Right track   |
| 4   | Black  | Left track    |
| 5   | White  | Front light - |
| 6   | Yellow | Rear light -  |

Please make sure all connected wires are correct. Connecting wrong wire could destroy the decoder.

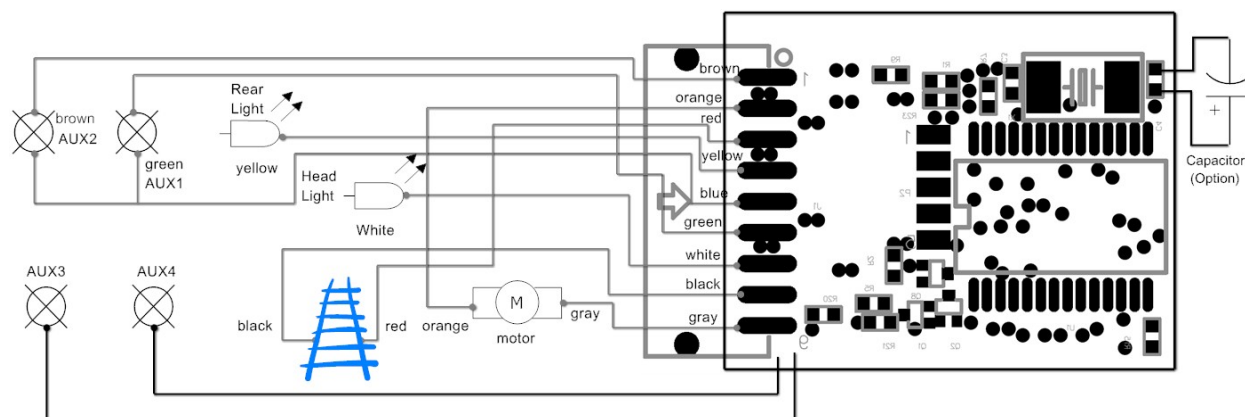
#### 4.5.1 Wiring Diagram for LocoCruiser LC202



#### 4.6 Locomotive with 21-pin DCC-standard Interface

According to the instructions in the locomotive manual, remove the body shell, and find the 21 pin plug. First, remove the plug from the socket and find the correct direction( Usually there's a number or arrow marked "pin 1" on the 8 pin head. And then fit with 8 pin head, you'll finish the installation.

#### 4.6.1 Wiring Diagram for LocoCruiser LC203



#### 4.7 Connecting Additional Functions

The Series 2 decoders have 4~6 additional functions. Each function output can reach 300mA.

## 4.8 Suitable Light Bulbs

Each function output can directly connect with 12 v bulb, unless the locomotive instructions say it cannot support the voltage of the bulb.

## 4.9 Suitable locomotive type

The ANE MODEL LocoCruiser standard decoder is suitable for all HO scale and some N scale locomotives (size permitting). The decoder is fully compatible with NMRA/DCC standards and can be controlled by various DCC (digital command control) systems which are compatible with DCC standards. Operating by conventional DC controller is possible without any problems.

# 5. Initial operation

## 5.1 DCC Mode

Remove any capacitors that are wired into the track feeders. This could impair the functionality of the decoder.

The LocoCruiser works with any DCC system. Unfortunately, the DCC protocol also bring some difficulties into the game. One of them occurs so often that we deal with it right away.

### 5.1.1 DCC Speed Steps ("flashing lights")

"Lights do not work " with DCC systems: DCC locomotives run with 14, 28, or 128 speed steps. The decoder must"know" the speed step setting of the command station. The command station must be able to operate with this mode and must be set accordingly. If this is not the case, the following problems may occur:

1. You cannot switch the lights with F0 at all.
2. The lights keep switching on and off dependent on the speed step.

In this case, make sure that the speed step settings of decoder and command station are the same.

## 5.2 Speed control

There are two speed control settings: the speed curve setting and the speed table setting.

### 5.2.1 Speed curve setting ( Factory Default ) :

The speed curve setting is to set the starting voltage in CV2, the maximum voltage in CV5 and the medium point voltage in CV6. In order to explain more, the speed step and the speed value are represented with a curve in an axis graph. In the following 4 figures (from 4-1 to 4-4), the horizontal line represents the speed step while the vertical line represents the speed value. The speed of the locomotive is divided into 28 steps in the speed step line. Thus, each step represents one speed step and the value is from 0 to 28. The speed value is the current speed of the locomotive and the value is from 0 to 255. The 14-step and the 128-step settings are similar with the curves. The 14-step speed setting is 14, the middle speed will be 7-step; on the other hand, when the loco is under 128-step speed, the middle speed will be 64-step.

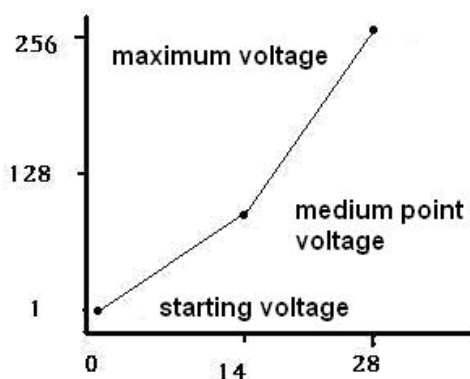


Figure 4-1 : Speed curve with  $CV6 < CV5/2$

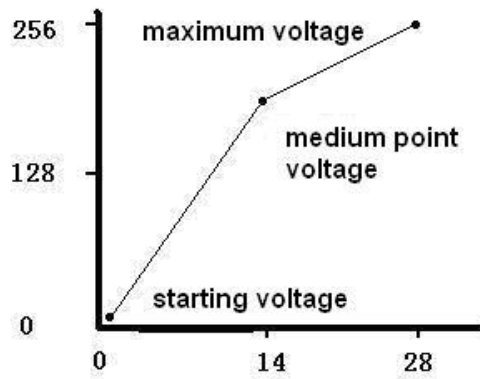


Figure 4-2 : Speed curve with  $CV6 > CV5/2$

You can see the change from the figure 4-2. If  $CV6 > CV5/2$ :

When the speed value is less than the middle value 14 (i.e., in a low speed status), the speed change is fast.

When the speed value is higher than the middle value 14 (i.e., in a high speed status), the speed change is slow.

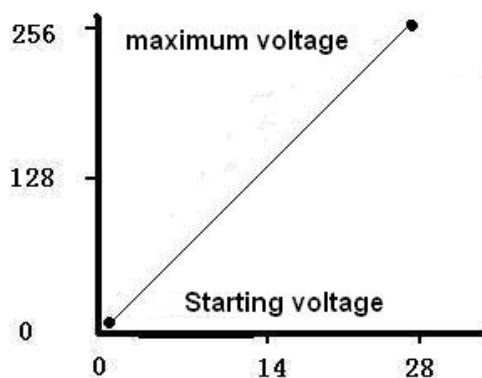


Figure 4-3 : Speed curve with  $CV6 = CV5/2$

You can see the change from the figure 4-3. If  $CV6 = CV5/2$ , both the high and low speed change are slow. It's the same result for the speed curve with  $CV6 = 0$  or 1.

## 5.2.2 Speed table mode

The speed curve is divided into 28 steps in the speed table mode. Each speed value responds the values from CV67 to CV94 (as per figure 4-4).

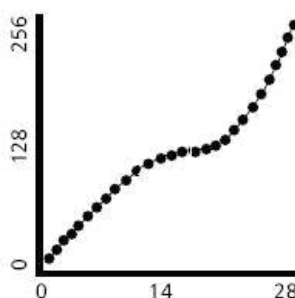


Figure 4-4 : Speed table

In the speed table mode, to modify the CV of the co-responding speed step means to modify the value of the speed step to achieve a different result.

### 5.2.3 Speed model Exchange

Setting bit 4 of CV29 enables to switch the two modes. The speed curve mode is activated if the value is 0; If the value is 1; the speed table mode is activated (default setting)

### 5.2.4 Acceleration & Deceleration

The final acceleration of the locomotive is determined by the value of CV3; on the other hand, the deceleration is determined by the value of CV4.

The higher the acceleration ( CV3 ) /deceleration ( CV4 ) value, the higher the final acceleration/deceleration. That is to say, the acceleration/deceleration speed of the locomotive is lower. The lower the value is, the lower the final acceleration/deceleration is. That is to say, the acceleration/deceleration speed of the locomotive is higher.

## 5.3 DC control

### 5.3.1 DC control method

Using a conventional DC controller to operate is possible without any problem. You can run a locomotive that already has the ANE MODEL LocoCruiser Standard series decoder installed, on 16VDC track. DC environment does not support Back-EMF function and lighting effect.

## 5.4 Engine address setting

### 5.4.1 Engine address

The engine address indicates the assigned numbers of the moving locomotives on the track. Setting the engine address will enable you to control the locomotives by the DCC controller. The following describes show the definitions of DCC protocol's engine address.

CV1 : Engine address

CV17&CV18 : Extended engine address

CV19: Consist address

The priority of the 3 engine addresses which are defined in the DCC protocol is: Consist address>Extended engine address >Engine address

### 5.4.2 Locomotive engine address setting

The first priority is the Consist address of CV19. The locomotives are under the control of the Consist address unless the value is 0 or 128. As for the "Extended engine address" (CV17&CV18) and the "Engine address" (CV1), if the value of the Extended engine address is not 0 and the value of bit5 of CV29 is 1, the locomotives will be under the control of the Extended engine address. If the value of the Extended engine address is 0 or the value of CV29 bit5 is 0, the locomotives are under the control of the Engine address.

Chapter 6 of this manual will show you the CV values. You can find the CV values which related to the engine address. The range of CV19 value that responds to the Consist address is from 1 to 127 and from 129 to 255. If the value of CV19 is larger or equal to 1 and is smaller and equal to 127, the locomotive will agree with forward direction. At this time, the locomotive is under the control of the address 1-127. If the value of CV19 is larger or equal to 129 and is smaller and equal to 255, the locomotive will accept the opposite direction. At this time, the locomotive is under control of the address (CV19 value-128).

The range of the Extended engine address (CV17&CV18) value is 128-9999. The value is according to the value of the lowest 6 bits of the CV17 combines with the 8 bits of CV18.

## 5.5 Light effect

### 5.5.1 Turn on/off light

The LocoCruiser standard series Decoder is equipped with 5 fixed lighting outputs. The relative values are stored in CV33 to CV37. The table 4-1 shows their default settings:

| CV | Function     | Default      | Range                                     |
|----|--------------|--------------|-------------------------------------------|
| 33 | F0F (on/off) | 1            | 1,<br>2,<br>4,<br>8,<br>16,<br>32,<br>128 |
| 34 | F0R(on/off)  | 2            |                                           |
| 35 | F1(on/off)   | 4            |                                           |
| 36 | F2(on/off)   | 8            |                                           |
| 37 | F3(on/off)   | 16           |                                           |
| 95 | F4(on/off)   | Not yet open |                                           |

Table 4-1: Lighting output on/off allocation (F0F is front light and F0R is rear light)

Note:

Value =1 control by F1

Value =2 control by F2

Value =16 control by F0

Value =128, always light on.

### 5.5.2 light effect

The CV33, CV34 values just effect the turn on or off status. However, the LocoCruiser standard series Decoder is featured with 10 lighting effects including the dimmer, the warning effect, the blinking per speed effect, the random blinking effect, the strobe light effect and 3 fixed-frequency blinking effects. Understanding more about the CV49 to CV53 will help you adjusting the CV settings to bring you more than one thousand of lighting effects. The information of CVs, outputs and light effects are shown in table 4-3 as below.

| CV | Function         | Default      | Range | Record your number in here |
|----|------------------|--------------|-------|----------------------------|
| 49 | FOF light effect | 16           | 0-255 |                            |
| 50 | FOR light effect | 8            | 0-255 |                            |
| 51 | F1 light effect  | 0            | 0-255 |                            |
| 52 | F2 light effect  | 0            | 0-255 |                            |
| 53 | F3 light effect  | 0            | 0-255 |                            |
| 96 | F3 light effect  | Not yet open | 0-255 |                            |

Table 4-2: Light effect allocation

## 5.6 CV29 setting

CV29 related to the operating efficiency of the decoder. The performance of every bit switch will have a significant impact on the decoder. In order to allow the modelers can easily adjust each bit of CV29, we make list of CV29 switch setting in particular in the following table, so you can refer to each different needs to adjust.

| CV29                 | Bit 0                     | Bit 1                    | Bit 2               | Bit 3                              | Bit 4       | Bit 5        | Value |
|----------------------|---------------------------|--------------------------|---------------------|------------------------------------|-------------|--------------|-------|
| Function description | Reverse direction of loco | 14 or 28/128 speed steps | DC analog operation | Bi-direction control (Not release) | Speed table | Long address |       |

|         |      |      |      |    |      |      |    |
|---------|------|------|------|----|------|------|----|
|         | --   | --   | --   | -- | --   | --   | 0  |
|         | Open | --   | --   | -- | --   | --   | 1  |
|         | --   | Open | --   | -- | --   | --   | 2  |
|         | Open | Open | --   | -- | --   | --   | 3  |
|         | --   | --   | Open | -- | --   | --   | 4  |
|         | Open | --   | Open | -- | --   | --   | 5  |
| default | --   | Open | Open | -- | --   | --   | 6  |
|         | Open | Open | Open | -- | --   | --   | 7  |
|         | --   | --   | --   | -- | Open | --   | 16 |
|         | Open | --   | --   | -- | Open | --   | 17 |
|         | --   | Open | --   | -- | Open | --   | 18 |
|         | --   | --   | Open | -- | Open | --   | 20 |
|         | --   | Open | Open | -- | Open | --   | 22 |
|         | Open | Open | Open | -- | Open | --   | 23 |
|         | --   | --   | --   | -- | --   | Open | 32 |
|         | Open | --   | --   | -- | --   | Open | 33 |
|         |      | Open | --   | -- | --   | Open | 34 |
|         | Open | Open | --   | -- | --   | Open | 35 |
|         | --   | --   | Open | -- | --   | Open | 36 |
|         | Open | --   | Open | -- | --   | Open | 37 |
|         | --   | Open | Open | -- | --   | Open | 38 |
|         | Open | Open | Open | -- | --   | Open | 39 |
|         | --   | --   | --   | -- | Open | Open | 48 |
|         | Open | --   | --   | -- | Open | Open | 49 |
|         | --   | Open | --   | -- | Open | Open | 50 |
|         | Open | Open | --   | -- | Open | Open | 51 |
|         | --   | --   | Open | -- | Open | Open | 52 |
|         | Open | --   | Open | -- | Open | Open | 53 |
|         | --   | Open | Open | -- | Open | Open | 54 |
|         | Open | Open | Open | -- | Open | Open | 55 |

## 6.Decoder Settings (Programming)

### 6.1 Configuration Variables (CV)

Almost all configuration Variables (CVs) LocoCruiser decoders follow the CV concept developed in the US. CV stands for "Configuration Variable" and indicates that the storage cells described above are not only variable but they also determine the behavior of the decoder.

#### 6.1.1 Standardisation in the NMRA

The NMRA ( National Model Railroad Association) has defined which CVs determine certain parameters of a decoder. The DCC standard allocates fixed numbers for certain CVs ( adherence is obligatory). This greatly simplifies things for the user since decoders of most manufacturers comply with this standard and therefore dealing with CVs requires the same process with the same CV-numbers regardless of the manufacturer.

The DCC concept permits to enter numbers ranging from 0 to 255 into CVs. Each CV carries only one number. While the position number is predetermined, the range of values may vary.

Not all CVs must accept values ranging from 0 to 255. The permitted values for LocoCruiser decoders are listed in the table in chapter 7 showing all available CVs.

### 6.1.2 Bits and Bytes

Most CVs contain numbers: CV1 for instance contains the locomotive address. This can be any number between 1 and 127. While most CVs expect numbers to be entered, some others are rather like a “collection point” of various “switches”, that administer different functions in one CV (mainly “on” or “off”): CVs29 and 49 are good examples: you must calculate the value for these CVs yourself. The value depends on which settings you want to program:

Have a look at the explanations for CV29 in the table in chapter 7: firstly, decide which options should be active. The column “Value” has two numbers for each option. If the option is switched off, the value is 0. Otherwise, it is a number between 1 and 128.

Add all the values for the respective options to arrive at the correct value for this CV.

## 7. CV value table

| CV | Function                     | Default | Range             | Remark                                           |
|----|------------------------------|---------|-------------------|--------------------------------------------------|
| 1  | Engine address               | 3       | 1 – 127           | CV29value adjustment, please see the chapter 5.6 |
| 2  | Start voltage                | 1       | 1-CV6 value       |                                                  |
| 3  | Acceleration                 | 5       | 0 – 255           |                                                  |
| 4  | Deceleration                 | 5       | 0 – 255           |                                                  |
| 5  | Maximum speed                | 0       | CV6 – 255 value   |                                                  |
| 6  | Medium speed                 | 0       | CV2-CV5 value     |                                                  |
| 7  | Version number               | 201     | Cannot be revised |                                                  |
| 8  | Manufacturer's ID            | 45      | Cannot be revised |                                                  |
| 10 | EMF Feedback Cut-out         | 255     | 0 – 255           |                                                  |
| 17 | Extended engine high address | 192     | 192 – 255         |                                                  |
| 18 | Extended engine low address  | 0       | 0 – 255           |                                                  |
| 19 | Consist address              | 0       | 0 – 255           |                                                  |
| 29 | Configuration register       | 6       | 0 – 255           |                                                  |

### 7.1 Light function

|    | Function         | Default | Range                                     | Record your number in here | Remark |
|----|------------------|---------|-------------------------------------------|----------------------------|--------|
| 33 | F0F (on/off)     | 1       | 1,<br>2,<br>4,<br>8,<br>16,<br>32,<br>128 |                            |        |
| 34 | F0R(on/off)      | 2       |                                           |                            |        |
| 35 | F1(on/off)       | 4       |                                           |                            |        |
| 36 | F2(on/off)       | 8       |                                           |                            |        |
| 37 | F3(on/off)       | 16      |                                           |                            |        |
| 95 | F4(on/off)       | 32      |                                           |                            |        |
| 49 | FOF light effect | 16      | 0-255                                     |                            |        |
| 50 | FOR light effect | 8       | 0-255                                     |                            |        |
| 51 | F1 light effect  | 0       | 0-255                                     |                            |        |
| 52 | F2 light effect  | 0       | 0-255                                     |                            |        |
| 53 | F3 light effect  | 0       | 0-255                                     |                            |        |

|    |                 |   |       |  |  |
|----|-----------------|---|-------|--|--|
| 96 | F4 light effect | 0 | 0-255 |  |  |
|----|-----------------|---|-------|--|--|

## 7.2 Speed table

|    | Function       | Default | Range |  | Remark |
|----|----------------|---------|-------|--|--------|
| 67 | Speed Table 1  | 1       | 0-255 |  |        |
| 68 | Speed Table 2  | 6       | 0-255 |  |        |
| 69 | Speed Table 3  | 12      | 0-255 |  |        |
| 70 | Speed Table 4  | 16      | 0-255 |  |        |
| 71 | Speed Table 5  | 20      | 0-255 |  |        |
| 72 | Speed Table 6  | 24      | 0-255 |  |        |
| 73 | Speed Table 7  | 28      | 0-255 |  |        |
| 74 | Speed Table 8  | 32      | 0-255 |  |        |
| 75 | Speed Table 9  | 36      | 0-255 |  |        |
| 76 | Speed Table 10 | 42      | 0-255 |  |        |
| 77 | Speed Table 11 | 48      | 0-255 |  |        |
| 78 | Speed Table 12 | 54      | 0-255 |  |        |
| 79 | Speed Table 13 | 60      | 0-255 |  |        |
| 80 | Speed Table 14 | 68      | 0-255 |  |        |
| 81 | Speed Table 15 | 76      | 0-255 |  |        |
| 82 | Speed Table 16 | 84      | 0-255 |  |        |
| 83 | Speed Table 17 | 92      | 0-255 |  |        |
| 84 | Speed Table 18 | 102     | 0-255 |  |        |
| 85 | Speed Table 19 | 112     | 0-255 |  |        |
| 86 | Speed Table 20 | 124     | 0-255 |  |        |
| 87 | Speed Table 21 | 136     | 0-255 |  |        |
| 88 | Speed Table 22 | 152     | 0-255 |  |        |
| 89 | Speed Table 23 | 168     | 0-255 |  |        |
| 90 | Speed Table 24 | 188     | 0-255 |  |        |
| 91 | Speed Table 25 | 208     | 0-255 |  |        |
| 92 | Speed Table 26 | 230     | 0-255 |  |        |
| 93 | Speed Table 27 | 252     | 0-255 |  |        |
| 94 | Speed Table 28 | 255     | 0-255 |  |        |

## 8. Disclosure announce

This warranty excludes the LocoCruiser standard series Decoder malfunction under the following reasons:

- ◆ User does not follow the instructions to install the Decoder, causing the product to be damaged or malfunction.
- ◆ User does not follow the instructions to operate the Decoder and make the product damaged or malfunction.
- ◆ User disassembles or replaces the component of the product by himself, then makes the product damaged or malfunction.
- ◆ The product is corroded, ignited or broken, because of improper management by user so that the product cannot work normally.
- ◆ User does not follow the instructions in this manual to operate the product, which causes damage or malfunction.

The right of the above declaration belongs to ANE Model.

## 9. Troubleshooting

Some reasons may cause the LocoCruiser standard series Decoder not to work as desired.

Here are some frequently asked questions and the answers that may help you use the product properly.

**9.1 The Decoder is installed. After electrified, the lights do not work and the locomotive does not move after changing speed.**

Check if the wires are fitted properly.

Check if any short circuits between the DCC control and the track.

**9.2 During the locomotive moving, the moving is not continuous.**

Check if the track is clean.

Check if the wires are fitted properly and good connections.

**9.3 The locomotive runs normally, but the lights do not work**

If the lights do not work, check if the wires are fitted properly. Repeatedly press the light button then see if something has changed.

Read the CV value that activates the lights and check if the lights are turned off. Refer to Chapter 5.3.1 for more detail.

If the problem remains, please ask our dealer for a new unit.

**9.4 Headlights work, but the locomotive does not move**

Read the value of CV1 and check if the engine address is different from the Decoder.

Rewrite the engine address.

**9.5 When I use the consist address to control the loco, I have changed the value of CV17 & CV18. But I still can't control the loco?**

Please check the CV29, bit 5 value. If the value of bit 5 is not 1, please change to 1.

**9.6 I have followed the manual to do, but still have problems not included in the manual. What can I do?**

If you still can't solve the problems, please contact us via E-mail or telephone, we will reply to you as soon as possible.

## **Appendix II : Repair information**

ANE Model provides you with the warranty and service for LocoCruiser standard series decoder as the following:

- 1 、 The LocoCruiser standard series decoder is replaced free of charge within 90 days and repaired free of charge within one year after purchasing.
- 2 、 After the free-of-charge repair period (one year), the LocoCruiser standard series Decoder provides a lifelong repair service with charge.